Data Gaps in the Risk Assessment for West Coast Groundfish EFH

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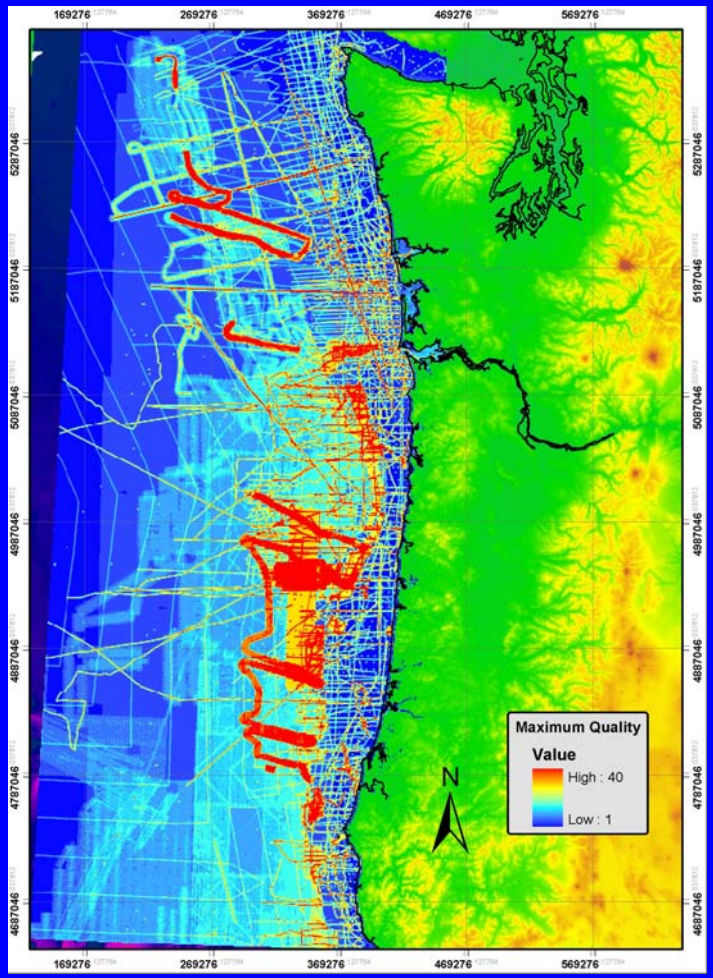
Abstract

The process of developing the Essential Fish Habitat Environmental Impact Statement has been constructive in identifying gaps in the information available for a comprehensive risk assessment for West Coast groundfish EFH. This is the first time a comprehensive, coast-wide assessment of EFH has been undertaken, at the current level of detail, for the West Coast. The West Coast assessment has required the compilation of new datasets, the use of existing datasets for purposes other than those for which they were originally intended, and the development of novel assessment techniques. As a result, the process of developing a risk assessment has revealed many and sometimes substantial gaps in our knowledge – gaps that in some cases are impossible to fill in the required time frame. The identification and assessment of data gaps could be considered an important product of the research effort to date, and is one that should feed directly into the development of management alternatives. A summary of data gaps will be presented along with a discussion of the implications and ways in which at least some of the information could be obtained.

Data Gaps in the Risk Assessment for West Coast Groundfish EFH



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Background

The current risk assessment …

- represents the first time a comprehensive assessment for EFH at this level of detail has been undertaken
- required a compilation of new data sets
- represents an application of data sets for purposes other than those for which they were originally intended
- required the development and application of novel assessment techniques

Background

The current risk assessment …

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- required a compilation of new data sets
- represents an application of data sets for purposes other than those for which they were originally intended
- required the development and application of novel assessment techniques

The process has revealed many gaps in our knowledge – a number of which remain unfilled.

The identification of data gaps could be considered an important product of the risk assessment and in some cases a road map for both future research as well as data mining efforts.

Data gaps for identifying EFH

- Geologic substrata
- Bathymetry
- Biogenic habitat
- Use of habitat by groundfish

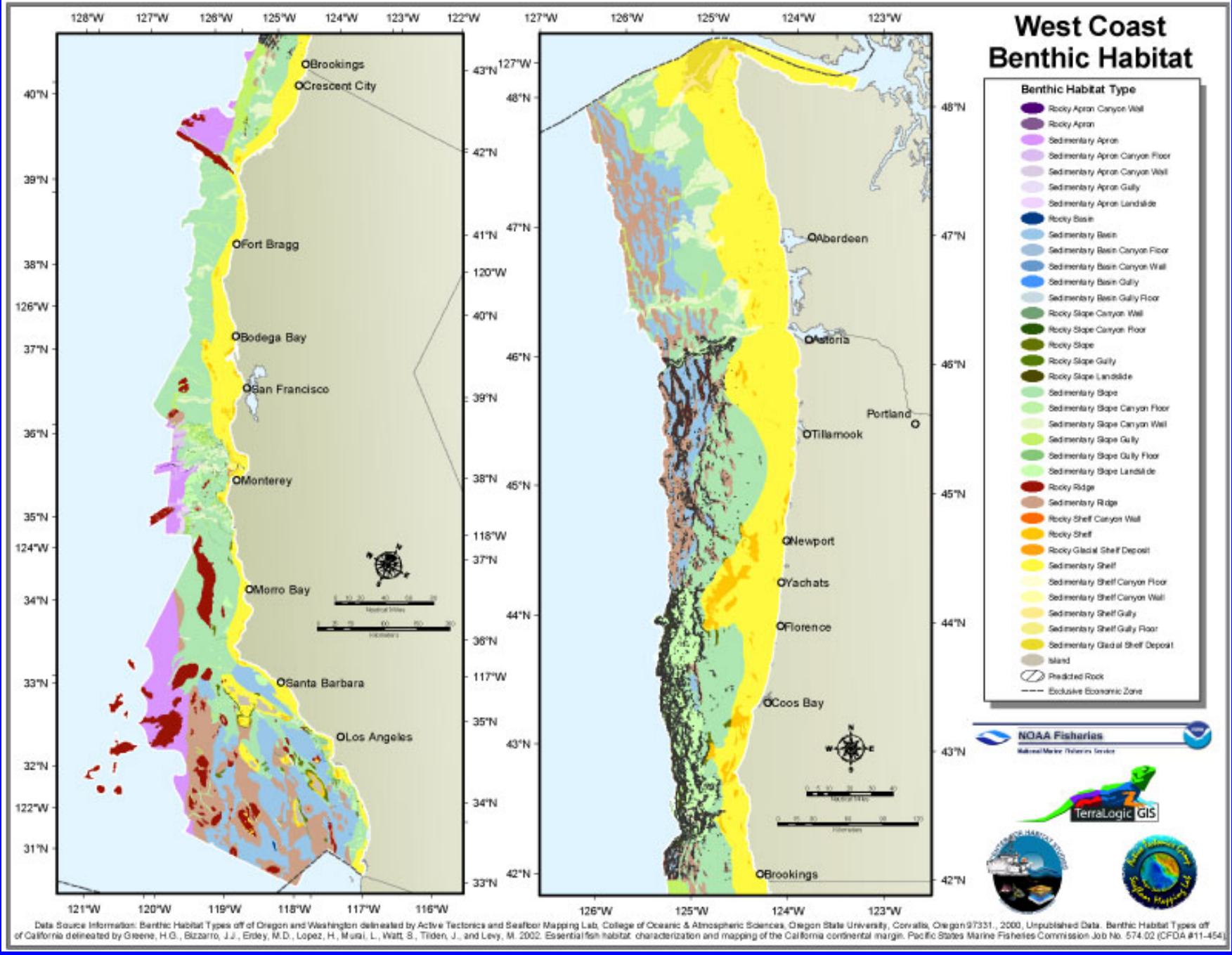
  Information from NMFS trawl surveys or Habitat Utilization Database (HUD)

  Almost entirely “level 1” or distributional data

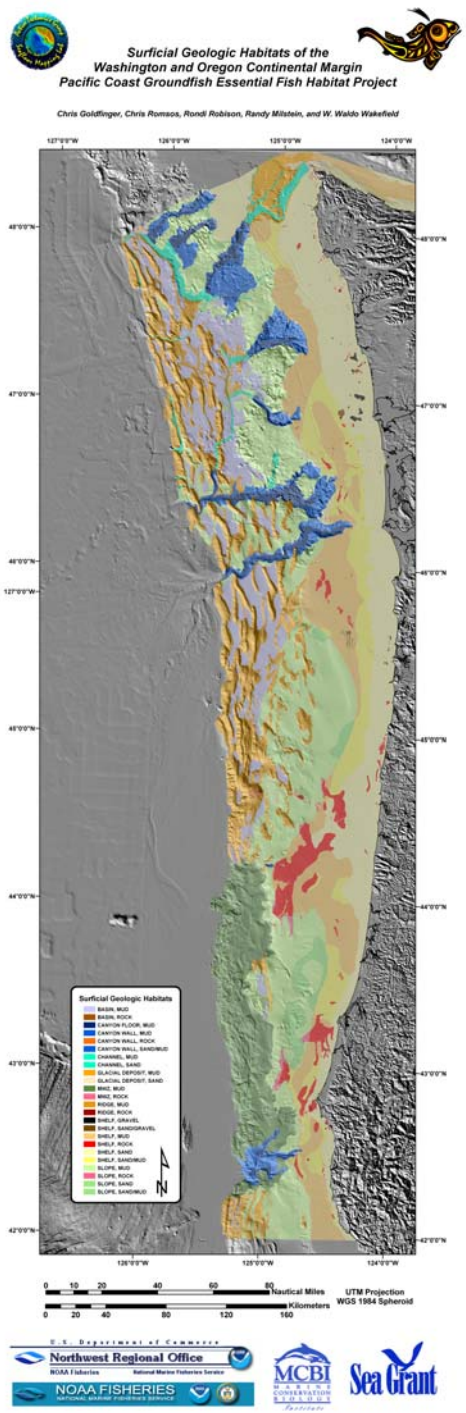
  Contrast: Level 2 – density data

  Level 3 – habitat specific growth, reproduction or survival

  Level 4 – habitat specific production rates



Data Source Information: Benthic Habitat Types off of Oregon and Washington delineated by Active Tectonics and Seafloor Mapping Lab, College of Oceanic & Atmospheric Sciences, Oregon State University, Corvallis, Oregon 97331., 2000, Unpublished Data. Benthic Habitat Types off of California delineated by Greene, H.G., Bizzarro, J.J., Erdey, M.D., Lopez, H., Murai, L., Watt, S., Tilden, J., and Levy, M. 2002. Essential fish habitat characterization and mapping of the California continental margin. Pacific States Marine Fisheries Commission Job No. 574.02 (CFDA #11-454)

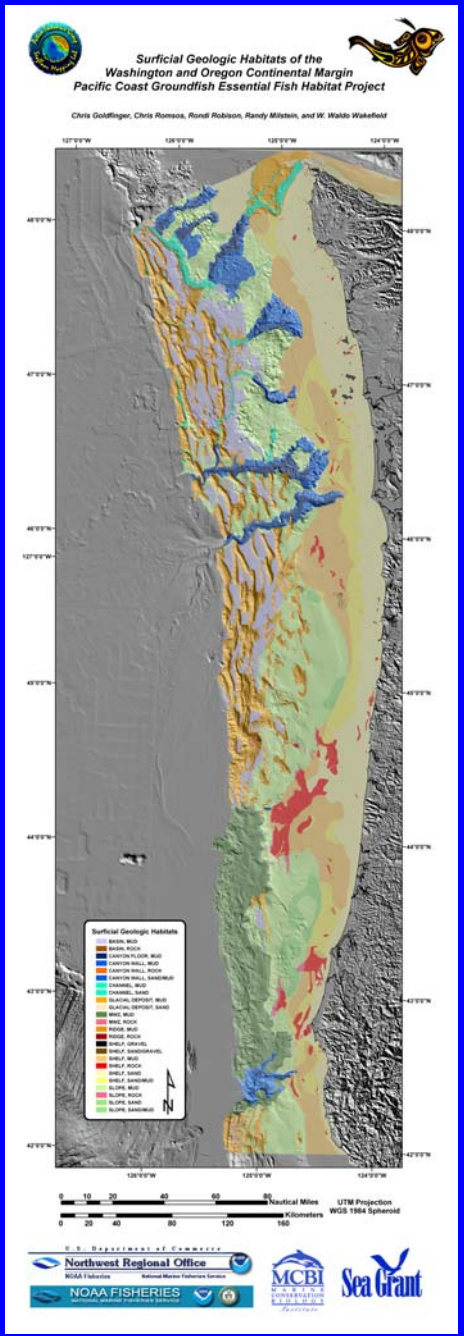


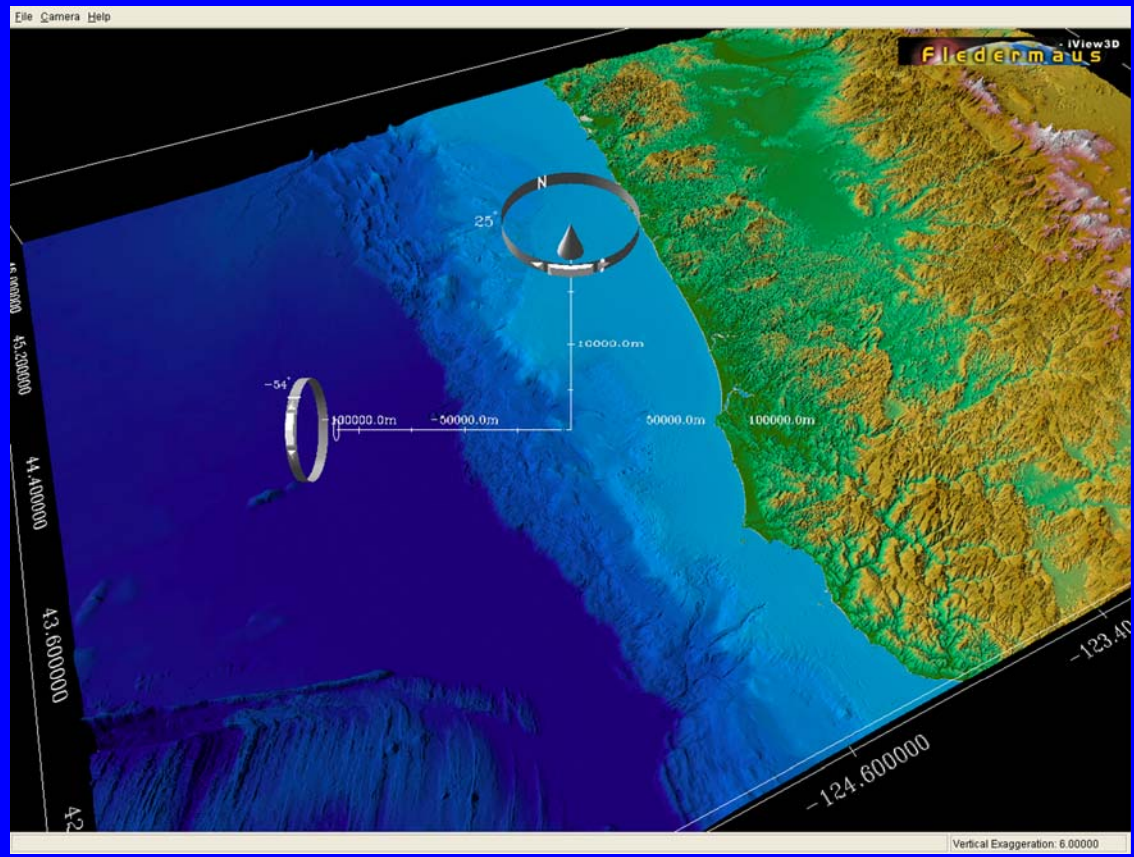
EFH Surficial Geologic Habitat (SGH) Maps Version 1

- How is SGH defined?
  - SGH types are used to represent the structural and lithologic seafloor character (physiographic features and their surficial lithology
- What is the geographic scope of the mapping project?
  - Oregon and Washington Continental margins, beach to abyssal plain
- What is the minimum mapping unit of SGH?
  - Tens of meters, determined by limits of the input data
- How will we incorporate additional information/revisions?
  - Version 1.5 is ready for EFH review process
- Where do I get the maps/data layers?
  - Version 1 is available through Terralogic GIS, Stanwood, WA or NOAA Fisheries NW Region, Seattle, WA

(Source: Goldfinger, Romsos, Robison, Milstein, and Wakefield)

Map Products, First Release





(Source: Goldfinger, Romsos, Robison, Milstein, and Wakefield)

Thematic map accuracy assessment, evaluating data density & quality

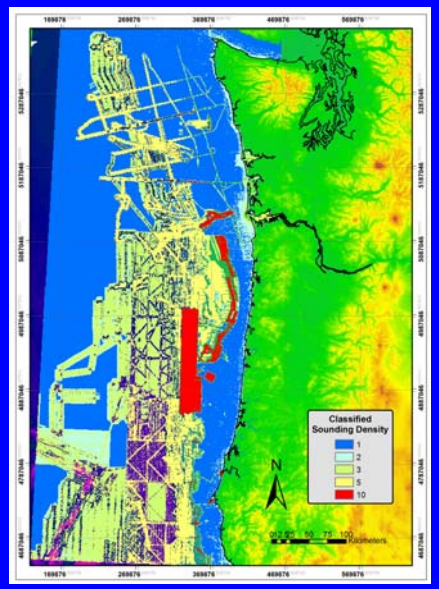
Limitations of data:

1. Some regions are well known, others are not. It's difficult to distinguish among these while viewing a map of habitat.

2. The EFH modeling approach demands a estimation of map accuracy.

3. The distribution and quality of data must be known to direct data collection in the future.

Bathymetric Density



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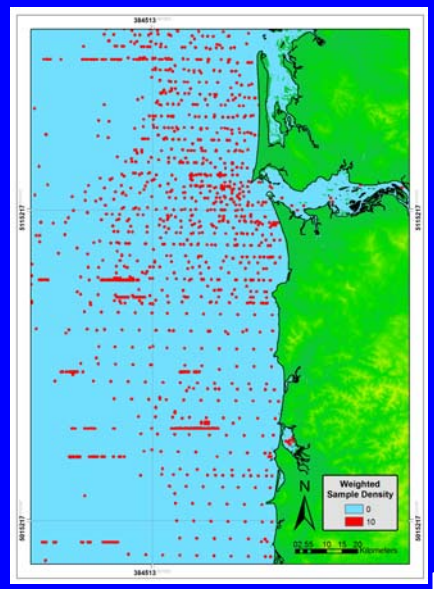
Sample Density



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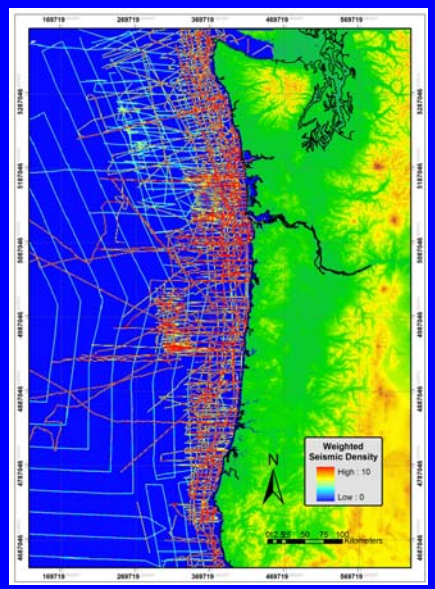
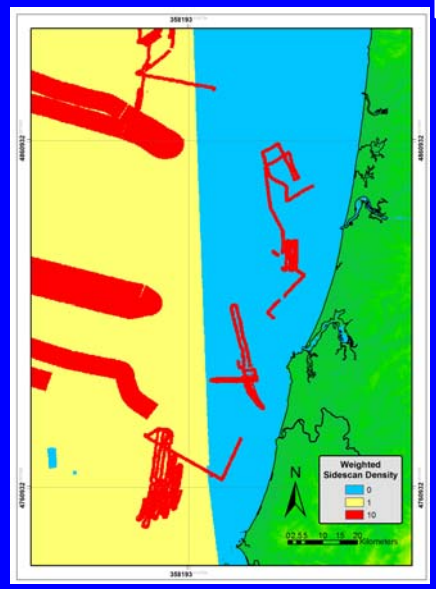


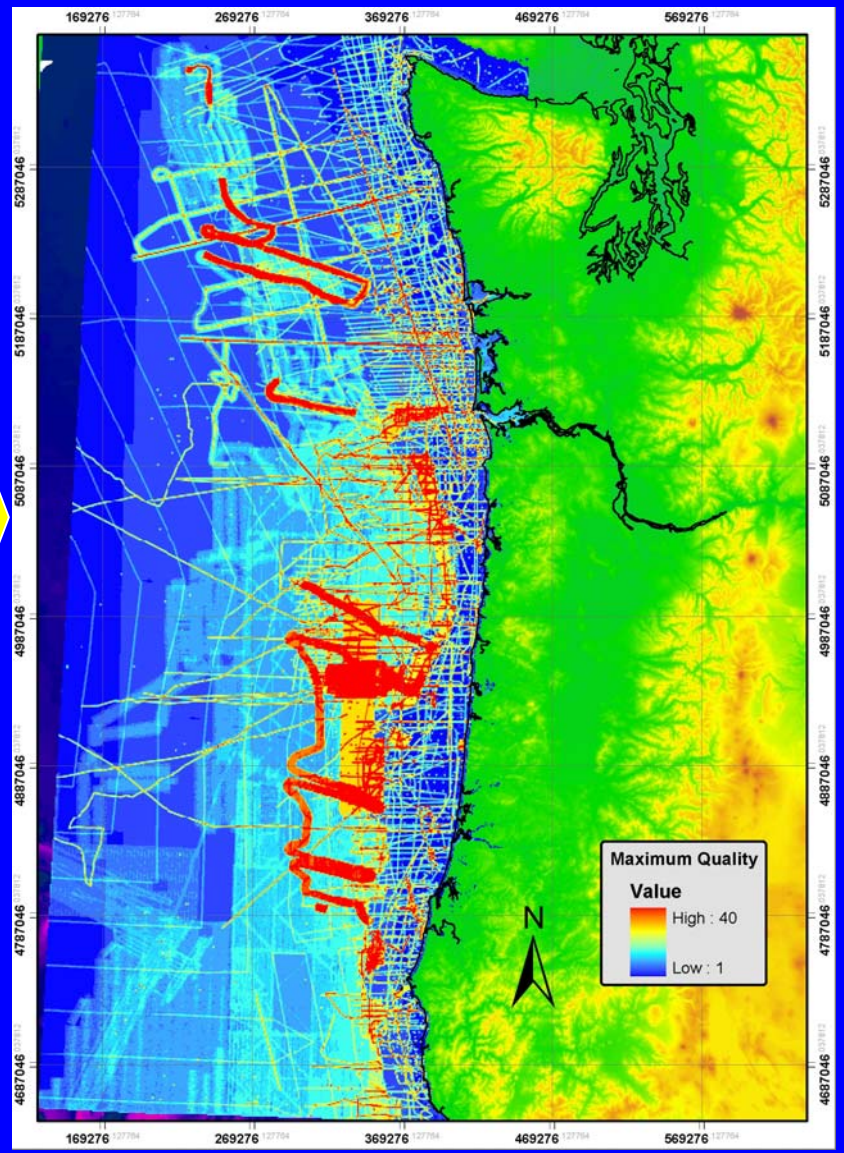
Seismic Density

+



Sidescan Density

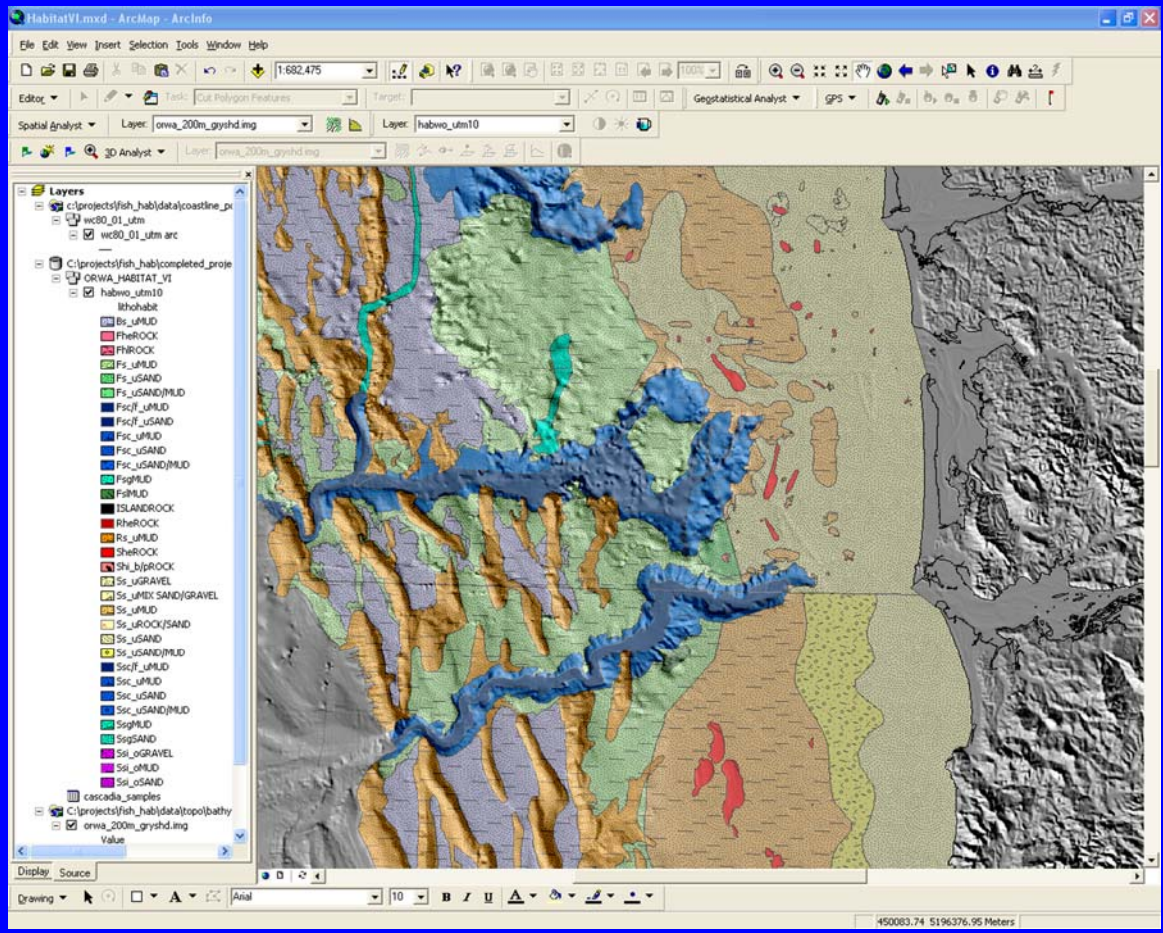
Final Additive Map of Data Quality



(Source: Goldfinger, Romsos, Robison, Milstein, and Wakefield)

Version 1 Problems/Revisions

- Example from Washington Surficial Lithology



October 2003 release of Version 1.0

(Source: Goldfinger, Romsos, Robison, Milstein, and Wakefield)

Version 1 Problems/Revisions

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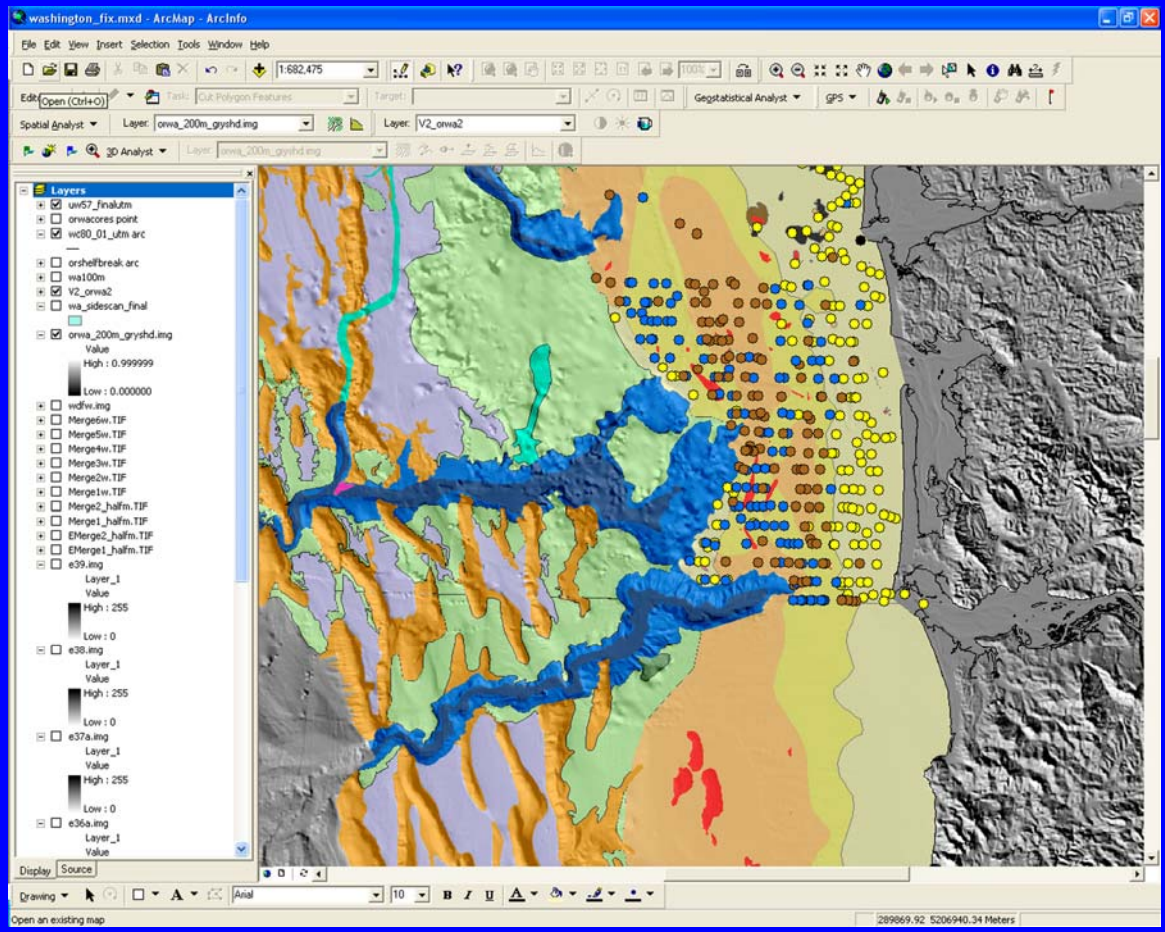

Location of newly acquired data from sediment cores off Washington's margin.

(Source: Goldfinger, Romsos, Robison, Milstein, and Wakefield)

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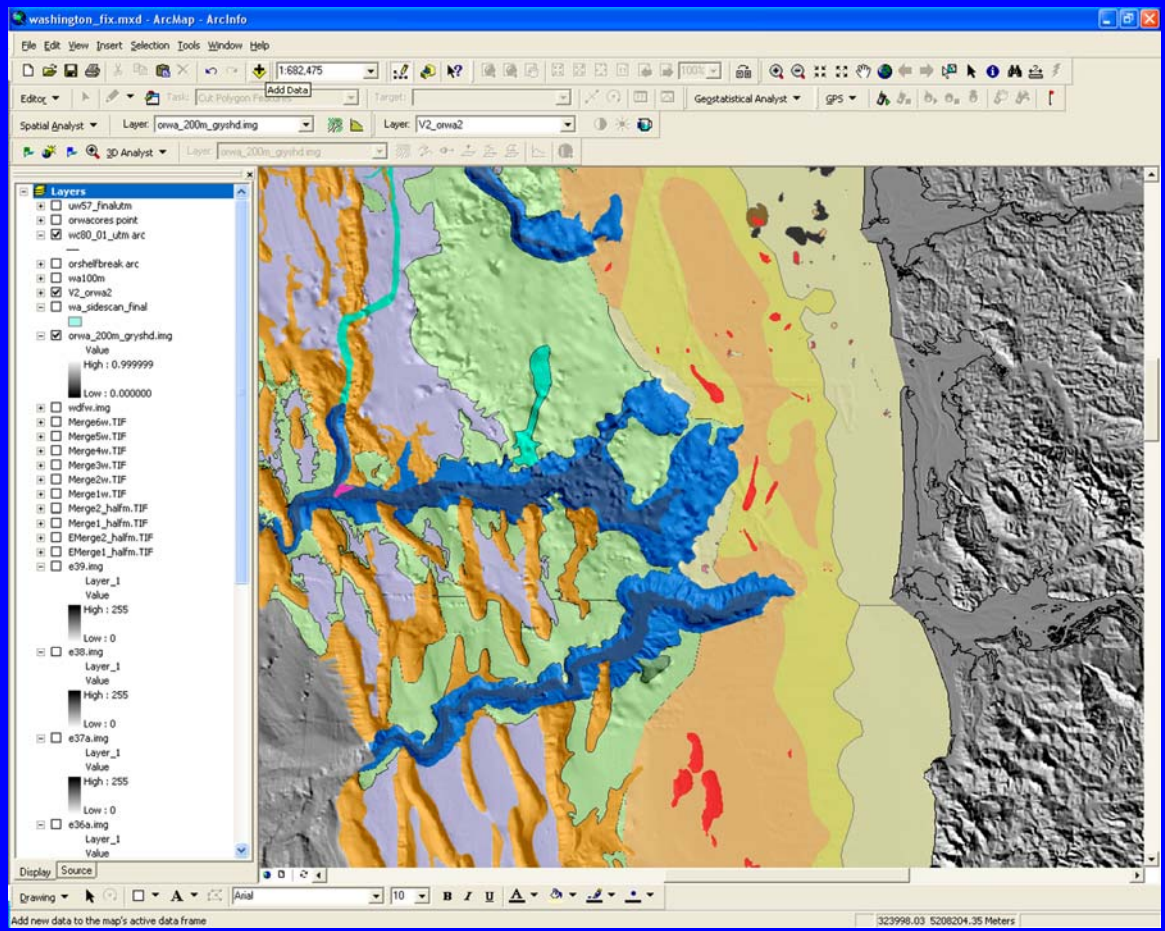
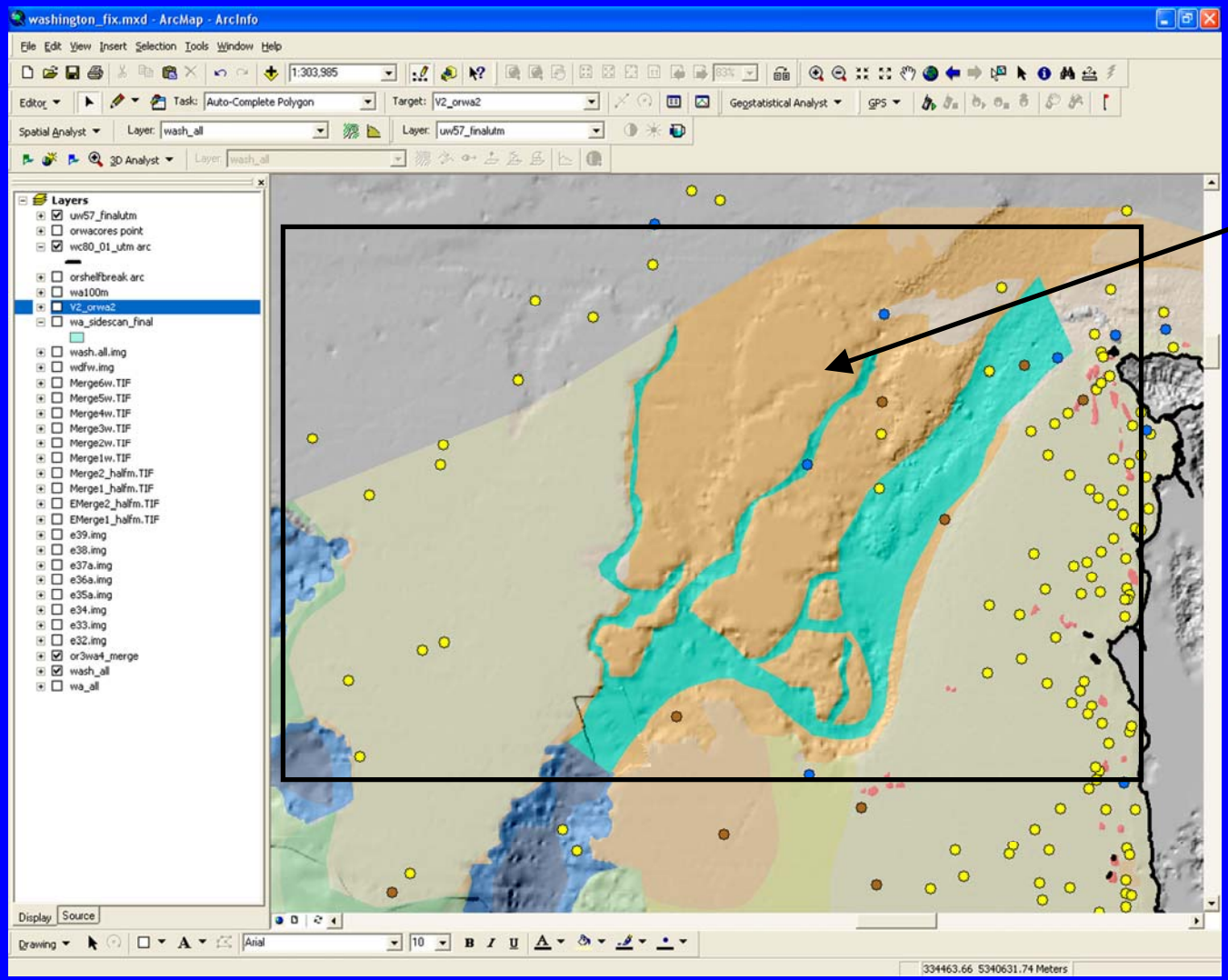


Revised surficial lithology for Version 1.5

(Source: Goldfinger, Romsos, Robison, Milstein, and Wakefield)

Version 1 Problems/Revisions

- Example from continental shelf off northern Washington

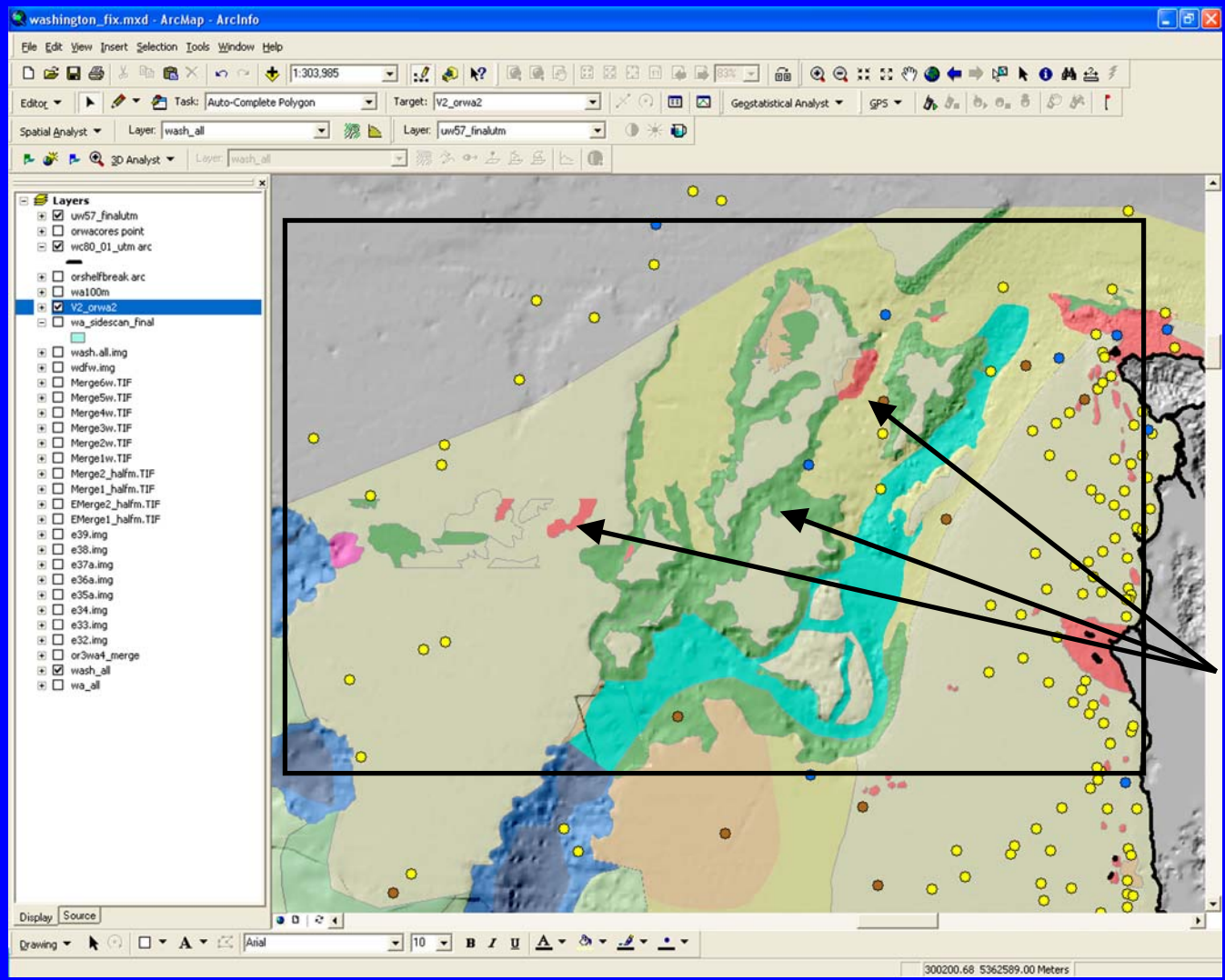


Large area coded as an unconsolidated mud glacial deposit. Little Hard substrate mapped.

(Source: Goldfinger, Romsos, Robison, Milstein, and Wakefield)

Version 1 Problems/Revisions

- Example from continental shelf off northern Washington



Remapped using side-scan sonar data supplied by OCMNS and WDFG.

Better knowledge of hard and mixed substrates.

(Source: Goldfinger, Romsos, Robison, Milstein, and Wakefield)

Revisions Updates

Incorporate data from these surveys:

MBARI/Tecflux (MB)

Ocean Explorer 2001(MB)

Ocean Explorer 2002 (MB)

Hydrate Ridge (SS)

OCNMS (MB & SS)

Siletz Reef (ODFW MB & SS)

OLEX (R/VRicker 2003 Single Beam)

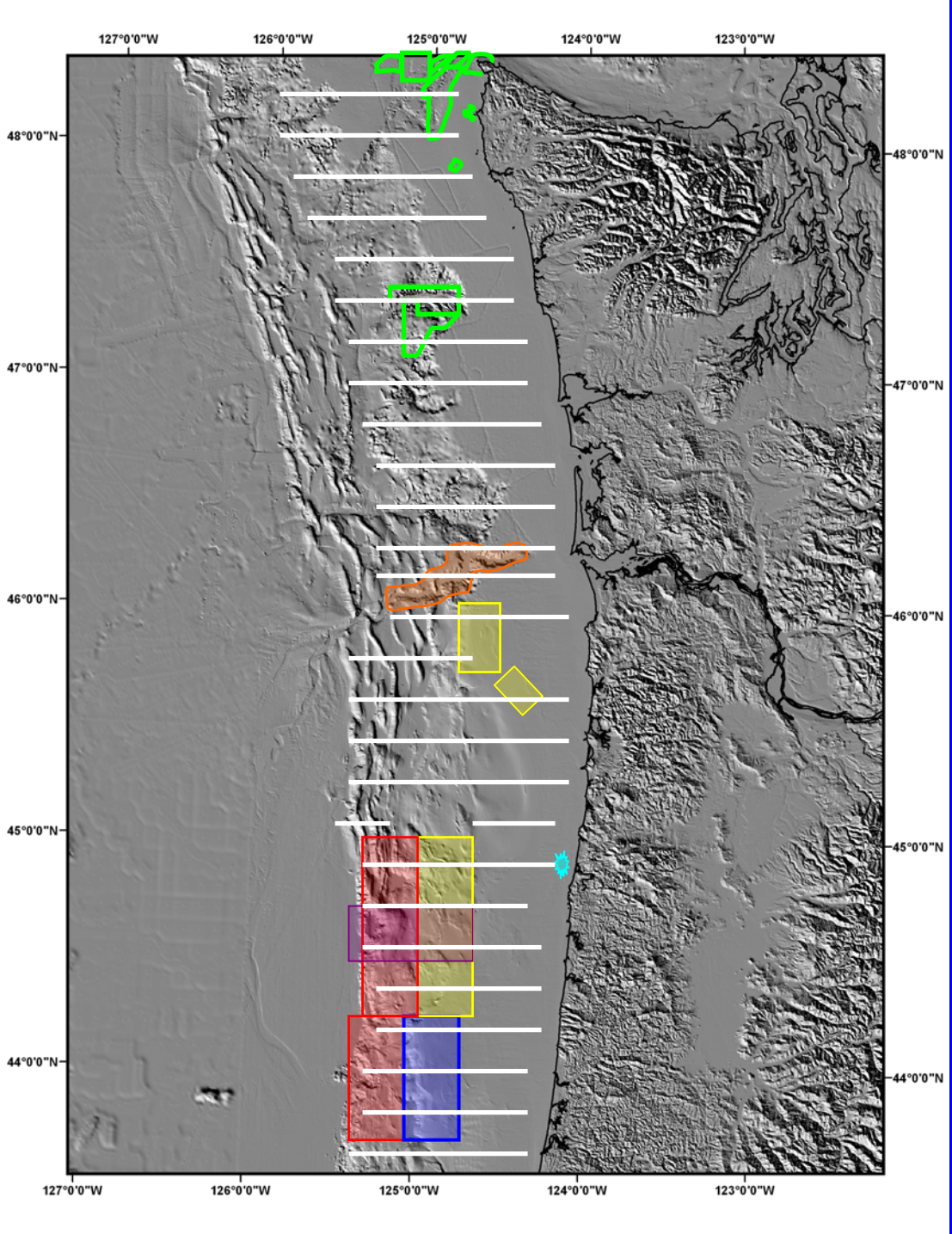
Improvements / New Data Layers:

Grainsize data where available

Map small submarine landslides

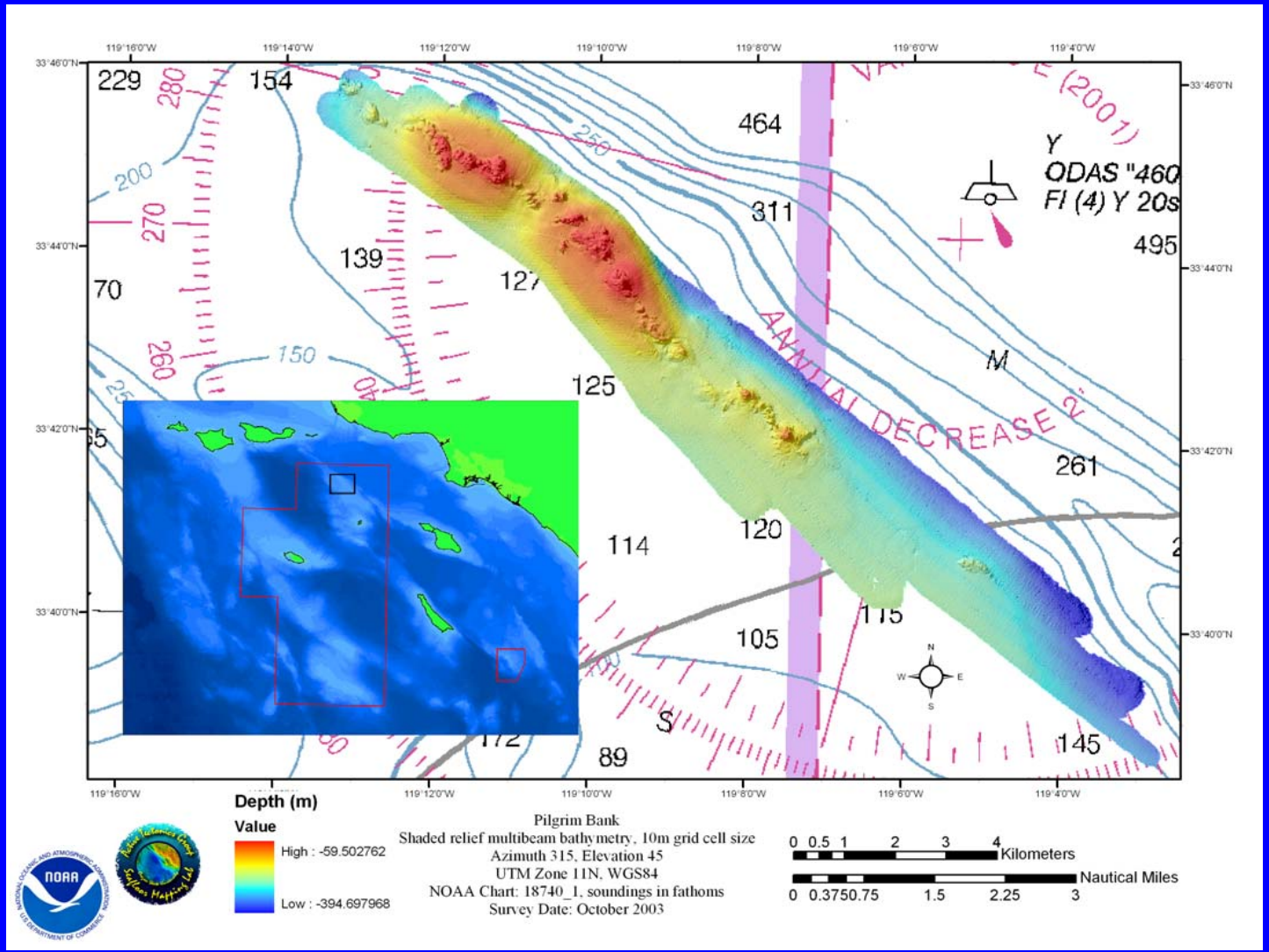
Rock Prediction layer

(Source: Goldfinger, Romsos, Robison, Milstein, and Wakefield)



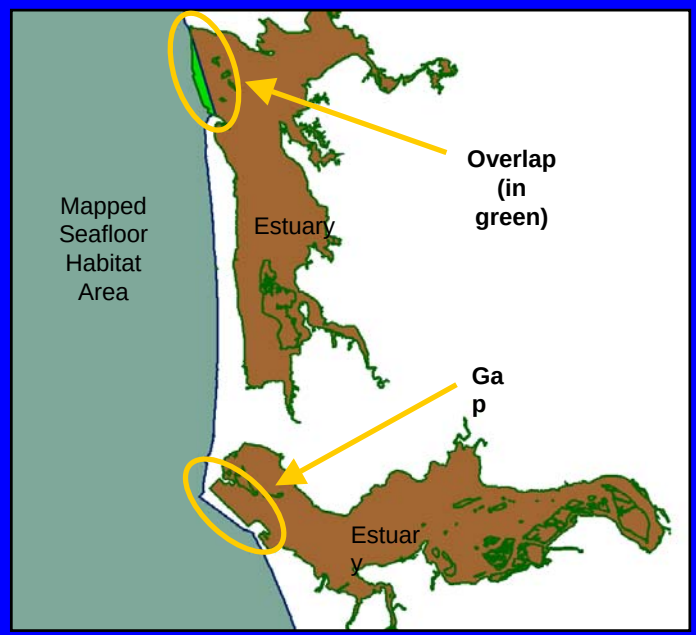
Ongoing project to map the rocky banks within the Southern California Borderlands – the Cowcod Conservation Area (CCA)

(SWFSC, OSU, and NWFSC collaboration)



Estuaries

- Estuaries generally not mapped by marine geologists (a few exceptions)
- Used data from 1998 EFH project – original source: National Wetlands Inventory and NOS Coastal Assessment Framework
- Some overlap and some gaps between estuary boundaries and seafloor habitat maps
- Lacks associated seafloor habitat information

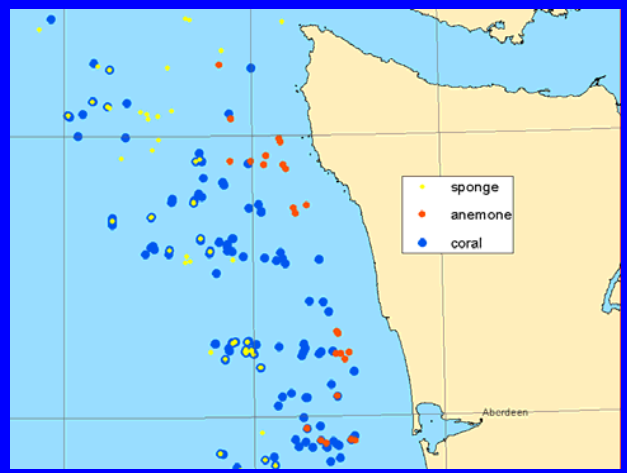


Biogenic Habitat

- **Kelp canopy**

- **Seagrass**

- **Structure-forming invertebrates**



- Limited information is available to spatially delineate these biological habitats coastwide.

Data gaps for identifying EFH

- Geological substrata
- Bathymetry
- Biogenic habitat
- Use of habitat by groundfish

  Information from NMFS trawl surveys or Habitat Utilization Database (HUD) (McCain, Miller and Wakefield, NWFSC FRAM)

  Almost entirely “level 1” or distributional data
  Little to no data for: Level 2 – density data
  Level 3 – habitat specific growth, reproduction or survival
  Level 4 – habitat specific production rates

Sources of information on species and life stages used in EFH model

Out of a total of 328 possible combinations of species and life stages (adults, juveniles, larvae, eggs):

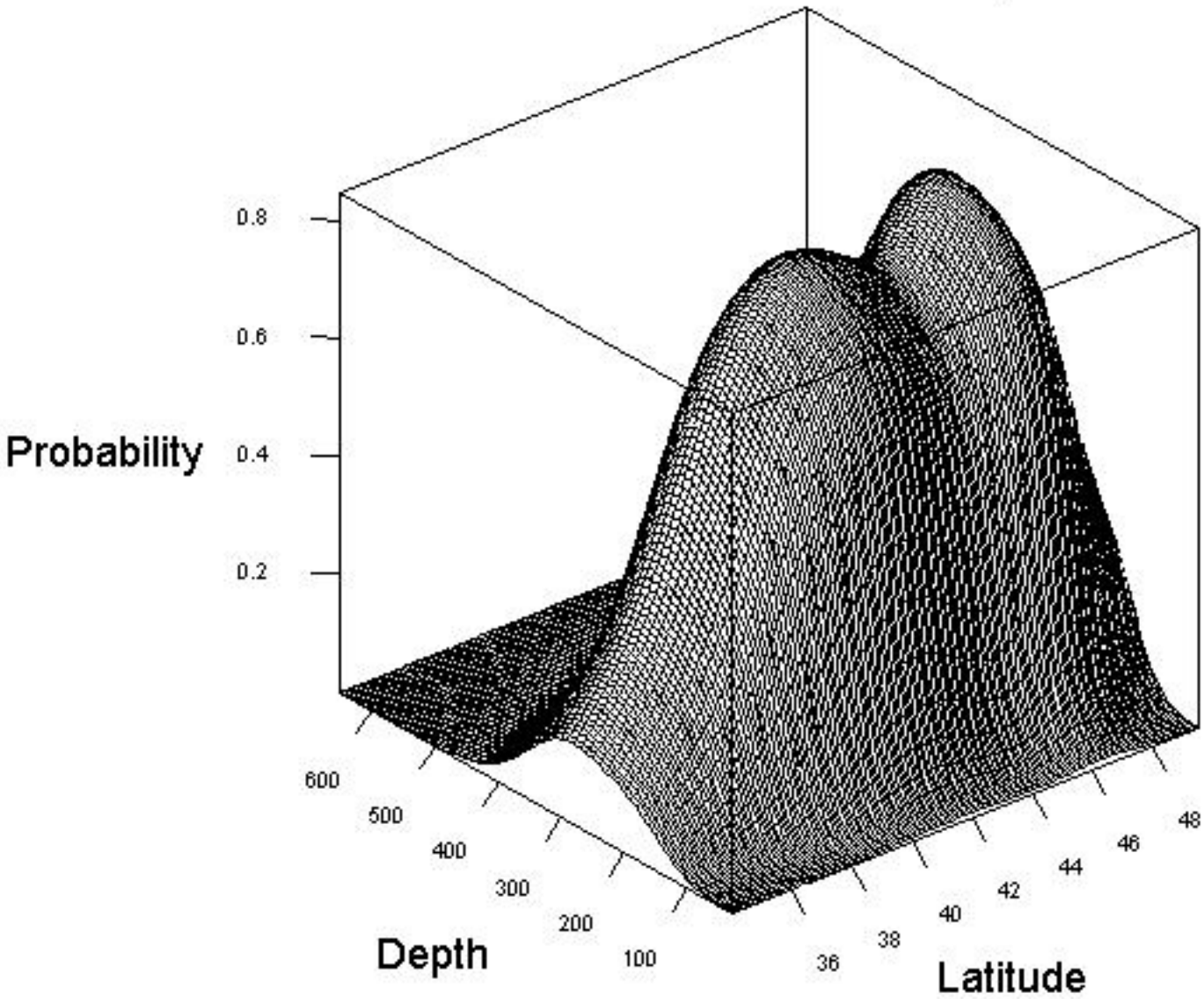
Survey latitude and depth profiles – 20

Surveys profiles plus expert opinion – 16

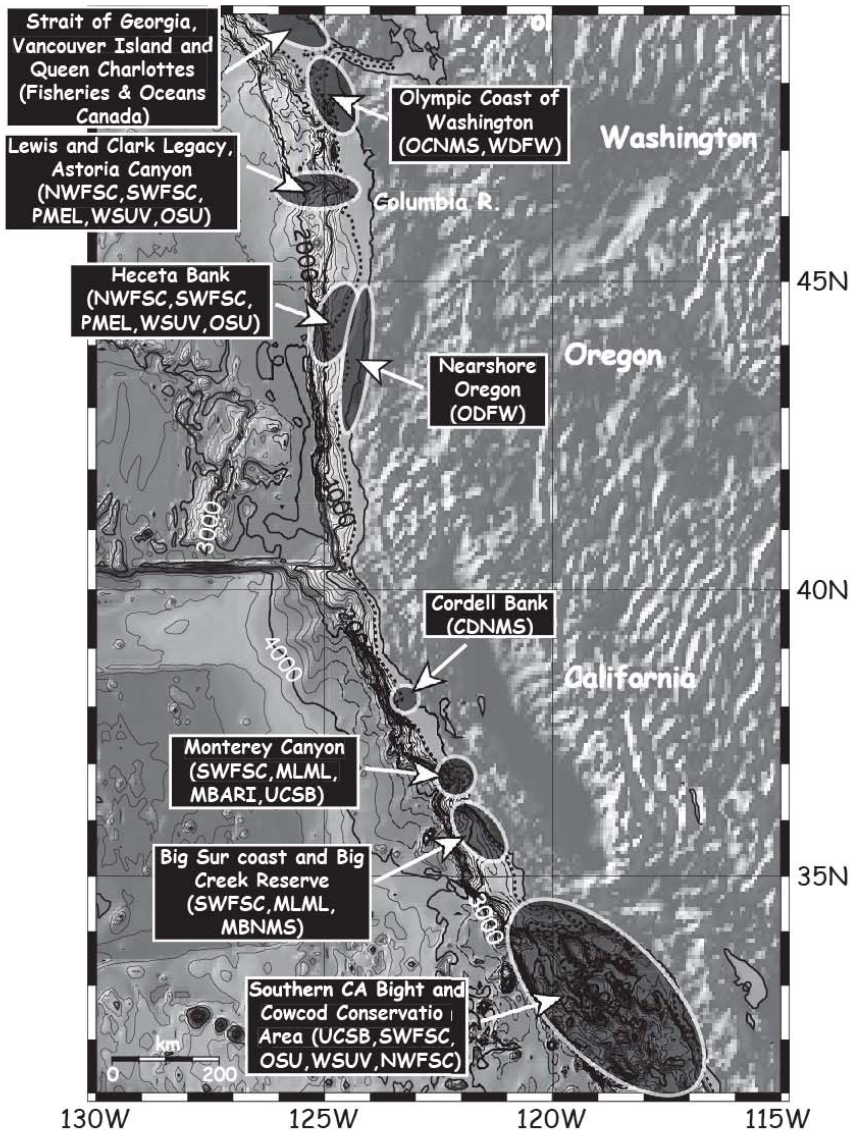
From the *Habitat Use Database* – 124

- Literature review
- Under review
- Living document

Habitat suitability for darkblotched rockfish derived from trawl survey database



Network of West Coast sites where advanced technologies for **seafloor mapping** and **direct observation** are supporting ongoing habitat-based research on benthic ecosystems



Recognized major data gaps:

Oceanography

Early life history distributions

Larval transport

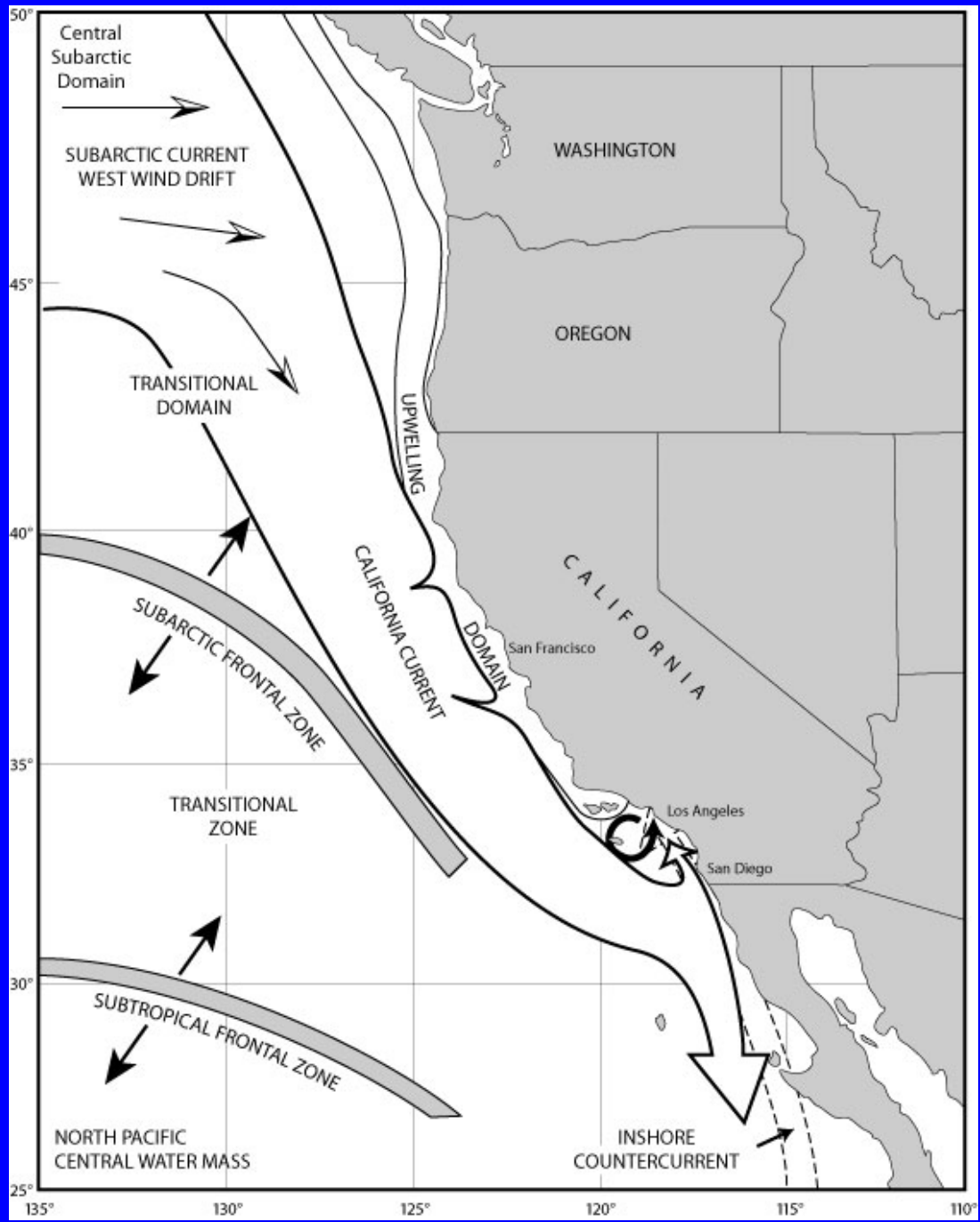


Figure: A schematic of the primary ocean currents off the Pacific Coast, as modified from PFMC (2003).

Effects of Fishing on Habitat

- Sensitivity and recovery
  - Based on a review of West Coast gear types, but derived largely from a review of studies outside of the region
  - Need for a better understanding of natural vs. anthropogenic disturbance – currently research in progress at OSU and Univ. VA (Wheatcroft and Wiberg) – field studies and modeling effort
- Fishing effort data
  - Only logbook data for trawl gear
  - Some promising focus group work with industry
  - For the future – West Coast observer data and VMS

West Coast Perspective on Non-Fishing Impacts: Development of Draft Index of Adverse Effects

Non-Fishing Activities Reviewed (adapted from Helvey, NOAA Fisheries SW Region)

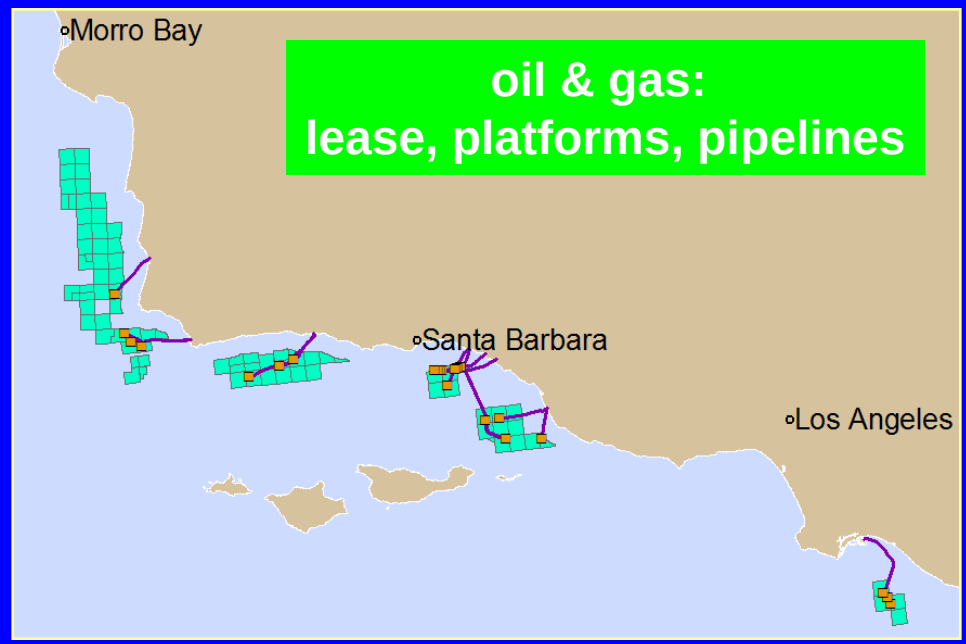
Upland: Agricultural/Nursery Runoff; Timber Harvest; Pesticide Application; Urban/Suburban Development; Road Building & Maintenance

Riverine: Mineral Mining; Sand and Gravel Mining; Organic Debris Removal; Inorganic Debris Removal; Dam Operation; Commercial & Domestic Water Use

Estuarine: Dredging; Disposal of Dredged Material; Fill Material; Vessel Operation/Transportation/Navigation; Introduction of Exotic Species; Pile Driving; Pile Removal; Over-water Structures; Flood Control/Shoreline Protection; Water Control Structures; Log Transfer Facilities; Utility Lines/Cables/Pipeline Installation

Coastal and Marine: Point Source Discharges; Fish Processing Waste; Water Intake Structure/Discharges; Oil/Gas Exploration/Development/Production; Habitat Restoration/Enhancement; Marine Mining; Persistent Organic Pollutants

Non-Fishing Impacts Data: Examples



Non-Fishing Impacts Data Collection

Data Collected :

Upland – USGS Land Use-Land Cover (1993) – coastwide

Riverine – Dam Locations – coastwide

Estuarine - Disposal of Dredged Material – Gray's Harbor, WA

Overwater Structures (marinas only) – WA, CA

Shoreline Protection – WA, CA

Aquaculture (approval level) – coastwide

Coastal and Marine –

Water Intake Locations – CA

Cable Locations/Pipelines – WA, OR

Oil/Gas -- Leases, Platforms, and Pipelines – coastwide

Other major issues

- Measuring cumulative impacts
  - Impacts that are cumulative when added to past, present and future actions
  - Could be especially difficult to consider cumulative impacts of both fishing and non-fishing impacts
- Economic and Social analysis

References

Goldfinger, C.C. Romsos, R. Robison, R. Milstein, and B. Myers. 2003. Interim seafloor lithology maps for Oregon and Washington, Version 1.1, Active Tectonics and Seafloor Mapping Laboratory Publication 03-01, Oregon State University, Corvallis (CD ROM).

Greene, H.G., Bizzarro, Joseph J., Erdey, Mercedes D., Lopez, H., Murai, L., Watt, S. and Tilden, J. 2003. Essential Fish Habitat Characterization and Mapping of California Continental Margin. Technical Publication Series No. 2003-01 (29 pages and 2 CDs) Moss Landing Marine Laboratories, Moss Landing, California.

Pacific Fishery Management Council (PFMC). 2003. Fishery Management Plan and Environmental Impact Statement for US West Coast Fisheries for Highly Migratory Species. NOAA Award No. NA03NMF4410067. August 2003. Pacific Fishery Management Council, Portland, Oregon.

Romsos, C.G. 2004. Mapping surficial geological habitats of the Oregon continental margin using integrated interpretive and GIS techniques. Masters thesis. Oregon State University, Corvallis.

Romsos, C., C. Goldfinger, R. Robison, R. Milstein, and **W. Wakefield**. Submitted. Development of a Regional Seafloor Surficial Geologic (Habitat) Map for the Continental Margins of Oregon and Washington, USA. *In* B. Todd and H.G. Greene, editors. Marine benthic habitat mapping. Geological Association of Canada, St. Johns, Newfoundland, Canada.